

CLAIMS

What is Claimed:

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1. A wafer carrier for supporting a substrate, comprising:
a circular plate having a flat edge region extending around the circumference of said plate; and
a circular recessed center region having a recessed bottom surface and including an upwardly inclined surface around the periphery of said recessed bottom surface, wherein the substrate is supported by a portion of the upwardly inclined surface and is spaced apart from said recessed bottom surface such that the substrate is supported by said wafer carrier only around the periphery of the substrate.
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2. The wafer carrier of Claim 1 wherein said recessed bottom surface further comprises at least one aperture formed therein for receiving at least one support member to engage the substrate.
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3. The wafer carrier of Claim 1 wherein said circular recessed center region has a diameter of approximately 200 mm.
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4. The wafer carrier of Claim 1 wherein said circular recessed center region has a diameter of approximately 300 mm.
5. The wafer carrier of Claim 1 wherein said upwardly inclined surface is inclined at an angle in the range of approximately 5 to 45 degrees to the plane of the recessed bottom surface.
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6. The wafer carrier of Claim 1 wherein said upwardly inclined surface is inclined at an angle of approximately 10° to the plane of the bottom recessed surface.
7. The wafer carrier of Claim 1 wherein said wafer carrier is comprised of a material having coefficient of thermal expansion in the range of 2.6×10^{-6} to $5 \times 10^{-6}/^\circ\text{C}$.

8. The wafer carrier of Claim 1 wherein said wafer carrier is comprised of a material having thermal conductivity in the range of 40 to 70 W/m/K.

5 9. The wafer carrier of Claim 1 wherein said wafer carrier is comprised of a material selected from the group of silicon carbide, aluminum nitride, large-grained polycrystalline silicon and silicon/silicon carbide alloy.

10 10. The wafer carrier of Claim 1 wherein the wafer is spaced apart from said recessed bottom surface by a distance of approximately 0.15 to 0.5 mm.

11. The wafer carrier of Claim 1 wherein the wafer is spaced apart from said recessed bottom surface by a distance of approximately 0.25 mm.

15 12. The wafer carrier of Claim 1 wherein said flat edge region has a width of approximately 5 to 25 mm.

13. A reactor for depositing a layer of material on a substrate, comprising:
a deposition chamber;

20 a wafer carrier in the deposition chamber, the wafer carrier having a circular plate with a flat edge region extending around the circumference of said plate, and a circular recessed center region having a recessed bottom surface and an upwardly inclined surface around the periphery of said recessed bottom surface, wherein the substrate is supported by a portion of the upwardly inclined surface and is spaced apart from said recessed bottom surface such that the substrate is supported by said wafer carrier only
25 around the peripheral edge of the substrate;

a gas inlet into the deposition chamber for conveying gases to the chamber; and an exhaust system for removing gases from the chamber.

30 14. The method of Claim 13 wherein said reactor is a low pressure CVD reactor.

15. The method of Claim 13 wherein said reactor is a atmospheric pressure CVD reactor.

5 16. The method of Claim 13 wherein said reactor is a plasma enhanced CVD reactor.

17. A CVD processing apparatus for processing a substrate, comprising:
a muffle;
at least one CVD chamber area within said muffle;
10 at least one injector for conveying gases into said at least one CVD chamber area;
a conveyORIZED belt passing through said chamber area and said muffle; and
at least one wafer carrier placed on said conveyORIZED belt for moving the substrate
though said chamber area whereby the gases process a surface of the substrate.

18. The CVD processing apparatus of Claim 17 wherein said wafer carrier further comprises:

a circular plate having a flat edge region extending around the circumference of said plate; and

20 a circular recessed center region having a recessed bottom surface and including an upwardly inclined surface around the periphery of said recessed bottom surface,

wherein the substrate is supported by a portion of the upwardly inclined surface and is spaced apart from said recessed bottom surface such that the substrate is supported by said wafer carrier only around the peripheral edge of the substrate.

25 19. The wafer carrier of Claim 18 wherein said upwardly inclined surface is inclined at an angle of approximately 10° to the plane of the recessed bottom surface.

20. The wafer carrier of Claim 17 wherein said wafer carrier is comprised of a material having coefficient of thermal expansion in the range of 2.6×10^{-6} to $5 \times 10^{-6}/^\circ\text{C}$.
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21. The wafer carrier of Claim 17 wherein said wafer carrier is comprised of a material having thermal conductivity in the range of 40 to 70 W/m/K.

5 22. The wafer carrier of Claim 17 wherein said wafer carrier is comprised of a material selected from the group of silicon carbide, aluminum nitride, large-grained polycrystalline silicon and silicon/silicon carbide alloy.

23. The wafer carrier of Claim 17 wherein the wafer is spaced apart from said recessed bottom surface by a distance of approximately 0.15 to 0.5 mm.

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